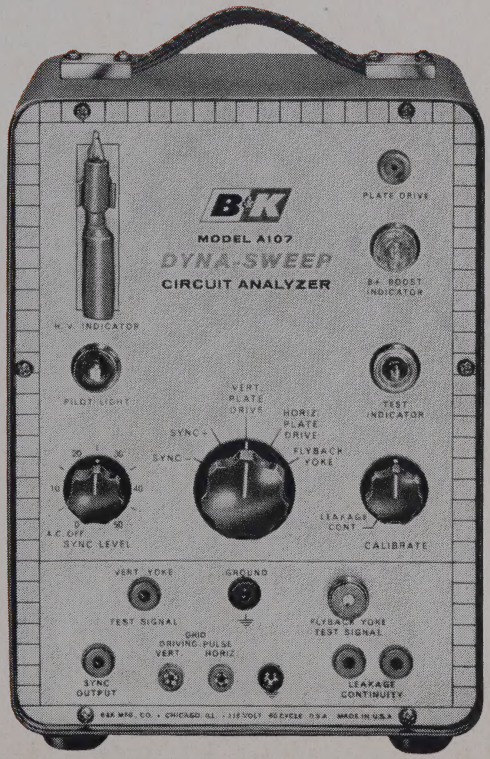
DYNA-SWEEP Model A107

CIRCUIT ANALYZER

INSTRUCTION MANUAL



B & K MANUFACTURING COMPANY

1801 W. BELLE PLAINE AVENUE, CHICAGO 13, ILLINOIS

INSTRUCTION MANUAL

FOR

Model A107

DYNA-SWEEP

CIRCUIT ANALYZER

B & K MANUFACTURING COMPANY
1801 West Belle Plaine Avenue
Chicago 13, Illinois

MODEL A107 DYNA-SWEEP CIRCUIT ANALYZER

What It Will Do

1. Provides composite synchronizing signals either sync negative or sync positive, adjustable in amplitude, to troubleshoot sync circuits.
2. Provides vertical output stage plate drive signal to check vertical output transformer, and yoke.
3. Provides vertical yoke test signal to determine if vertical yoke windings are defective.
4. Provides horizontal driving signal to drive horizontal output transformer directly in a T-V receiver.
5. Provides B+ boost indicator.
6. Provides hi-voltage indicator.
7. Provides sensitive leakage and continuity test for horizontal output transformer.
8. Provides sensitive test to determine if horizontal output transformer has internal shorted turns.

CONTROLS AND OUTPUT JACKS

What They Do

1. SYNC LEVEL AND ON-OFF SWITCH. This control turns the instrument on and off and is used to adjust the level of composite sync signal available at the sync output jack. Sync is available over a range of 0 to approximately 50V peak to peak. The phase can be either sync positive or sync negative by setting the Selector switch to the appropriate position. The sync level control is calibrated directly in peak to peak volts.

2. PLATE DRIVE VERTICAL. A high level signal is available from the Plate Drive jack and ground to drive directly the vertical output transformer. The Selector switch must be in the Vertical Plate Drive position.

3. VERTICAL YOKE TEST SIGNAL. This signal is obtained at the Vertical Yoke Test Signal jack and ground. This signal is always present at this jack regardless of the Selector switch position.

4. HORIZONTAL PLATE DRIVE. A high level signal is available from the Horizontal Plate Drive jack and ground. This signal will drive the horizontal output transformer of a TV receiver completely bypassing the receiver H.O. tube. The Selector switch must be in the Horizontal Plate Drive position.

5. BOOST INDICATOR. This indicator is used in conjunction with the horizontal plate drive test and will indicate the presence or lack of boost B+.

6. HI VOLT INDICATOR LAMP. This indicator when connected to the insulated plate lead going to the hi voltage rectifier tube will indicate the presence or lack of hi r.f. voltage.

7. LEAKAGE-CONTINUITY TEST. This test is made with test leads connected to Leakage-Continuity jacks with the selector switch set to the Flyback-Yoke test signal position. This test can be used to measure continuity in a winding and leakage between windings or leakage from a winding to the core. The sensitivity is approximately 10 megohms. The calibrate control must be set to the leakage continuity position. Continuity or leakage will be indicated by a glow of the test indicator lamp.

8. SHORTED TURNS TEST. For this test the Selector switch must be set to the Flyback-Yoke test signal position. The shielded cable is connected to the Shorted Turns connector. By adjustment of the Calibrate control and observation of the test indicator lamp shorted turns will be detected in flyback transformers and horizontal windings of deflection yokes. As few as one single shorted turn may be detected.

The B & K Model A-107 Dyna Sweep Circuit Analyzer is designed to be used in conjunction with the B & K Model 1075 Television Analyst. Its purpose is to provide additional vertical and horizontal sync and driving pulses to enable the TV serviceman to more easily and quickly check out every stage in the sync and sweep sections of a television receiver. The instrument will be found to be extremely useful in tracking down troubles in the horizontal and vertical output circuits including the horizontal output transformer and yoke.

MODEL A-107 OPERATION

To place the Model A-107 Dyna Sweep Circuit Analyzer in operation, plug its line cord into an AC power line wall socket. The three leads at the rear of the instrument are then plugged into the appropriate pin terminals of the Model 1075. The black lead represents ground, therefore, it is connected to the ground terminal of the Model 1075. The lead with the blue jack plugs into the vertical driving pulse pin jack on the Model 1075. The lead with the red jack is inserted into the horizontal driving pulse pin jack on the Model 1075. These connections bring the vertical and horizontal driving pulses from the Model 1075 to the Model A-107 where they are combined into a composite signal. The vertical driving pulse amplitude control located on the left side of the Model 1075 must be set to maximum for correct calibration of the sync level control.

USING THE DYNA-SWEEP TO CHECK SYNC SEPARATOR STAGES

With the Model A-107 and its companion Model 1075 Television Analyst, it is possible to quickly and thoroughly check the sync separator stages of any television receiver. To illustrate the procedure to follow, three representative sync separator sections will be discussed.

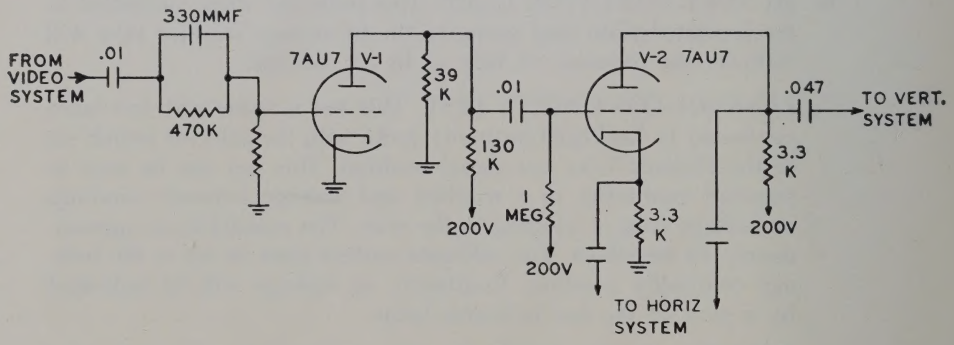


Figure 2
A typical sync separator system.

A fairly simple sync separator system is shown in Fig. 2. This is seen to consist of the two triode sections of a 7AU7. We will assume that the picture is completely out of sync vertically and horizontally and we wish to check out these stages to determine if the trouble lies here.

As a first step, connect the Model 1075 Television Analyst to the receiver so that an image appears on the screen. The point of signal injection may be at the antenna terminals. It would be desirable not to inject the test pattern signal into the video amplifier stages because we might do this beyond the point where the sync signal take-off occurs. Rather than spend time looking for this point, inject the signal as indicated above.

The next step is to apply a composite sync signal from the Model A-107 to the grid (and chassis or B—) of V2, Fig. 2. It is important that the proper polarity sync signal be applied and ordinarily the technician would have to figure this out by checking through the schematic. With the Dyna-Sweep such checking is not necessary. Simply apply the sync pulses from the Dyna-Sweep to the control grid of V2. If the image on the screen locks into sync, we know the sync signal is passing through V2 and locking in the vertical and horizontal oscillators.

If the picture on the screen remains out of sync then reverse the polarity of the sync signal by turning the selector switch to the other sync position. That is, if it was originally on position one, producing a negative sync output then switch it to position two. If it was originally on position two, providing a positive sync output, switch it to position one. The picture will lock in now, if both deflection systems are operating normally. If the picture still remains out of sync, the sync pulses are not reaching the vertical and horizontal sweep oscillators. In that case, inject the sync pulses at the plate of V2 and repeat the procedure.

If application of the test pulses at the grid of V2 locks the picture in, shift the signal injection lead to the control grid of V1. Inability to sync the picture indicates a defect in V1 or its associated circuit. Voltage and resistance checks should then uncover the faulty component.

It is possible to perform the same test using the vertical pulses alone or the horizontal pulses alone. This is accomplished by disconnecting the proper plug from the 1075. This would be done if only one system was out of sync and we wished to determine where its pulses were being stopped.

The level of the test sync pulses may be set at any point between 0 and 50 volts. In most instances, a mid-setting of the sync level control will serve satisfactorily. However, if you find that the full 50 volts peak-to-peak must be used in order to secure adequate synchronization, chances are there is something defective in the circuit. It may be that the pulses are not being properly amplified or that some component has radically changed its value, reducing the stage gain far below its normal figure. It is also well to keep in mind that the level of the injected sync pulses should be lowered whenever the signal lead is moved from plate to grid of a stage, or in going from the grid of one stage to the grid of a prior stage. In short, whenever you add more stages through which the pulse signal must pass, lower the output of the Dyna-Sweep.

Since the sync level control is calibrated in volts, any level of signal that is required may be injected into a receiver sync system. A schematic may indicate that 35 volts peak-to-peak may be required to drive a particular

stage. By setting the sync level control to 35 and injecting sync at this point you may determine if that stage will work properly with this level of signal.

A more elaborate sync separating system is shown in Fig. 3. The method of approach is still the same, however. That is, when a symptom of poor synchronization appears, you inject the composite sync signal from the Dyna-

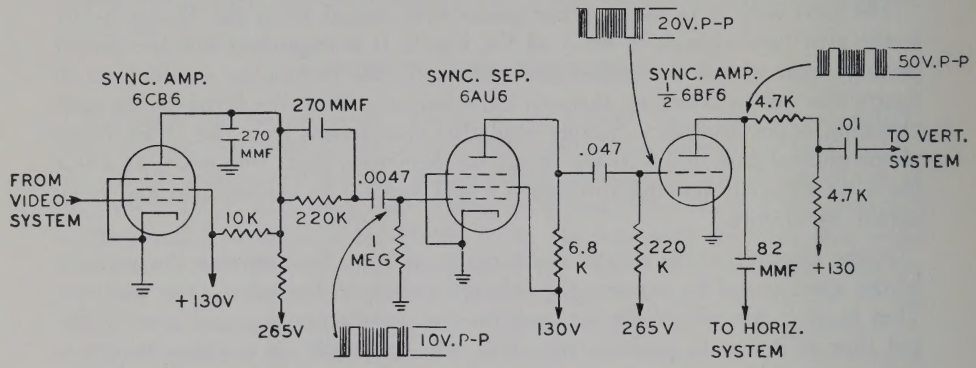


Figure 3
A more elaborate sync separator system.

Sweep at the plate and grid of each stage in the sync separation system, working from the stage closest to the deflection systems back to the stage that receives the initial video signal from the video system. The only thing to remember is that sync polarity must be reversed when switching from plate to grid. Failure to observe this precaution may erroneously lead you to believe that a stage is defective.

As a precautionary rule, whenever you reach a point in the sync separator system where the injected pulses do not lock in the picture, try both polarity pulses. If you find that one polarity of sync pulse does lock in the picture, the stage is operating satisfactorily.

Within the past few years pentagrid tubes have been employed for the sync separating function, at the same time also helping to reduce the amplitude of any noise pulses that may be riding along with the signal. A typical circuit of this type is shown in Fig. 4. There is a 6BY6 pentagrid tube followed by a triode sync amplifier. A fairly small video signal with the sync pulses negative is fed to grid No. 1. The sync stabilizer control connected to the grid is adjusted so that tube current just flows with normal input signals.

An amplified version of the same video signal, with the sync pulses positive now, is obtained from the plate of the video amplifier and applied to grid No. 3 of the 6BY6. These sync pulses are strong enough to cause grid currents to flow in this circuit, charging capacitor C1 to a value approximately equal to the peak-to-peak amplitude of the applied pulses. In the interval between pulses, the negative voltage on grid No. 3 is high enough to prevent current from flowing through the tube. Thus, when the circuit is operating normally and a video signal is received, current will flow through the

6BY6 only during the sync pulse interval and only sync pulses will appear across the output load resistor.

Consider now what happens when noise pulses appear at the same time. These noise pulses will be transferred first to grid No. 1 and if they are strong enough, they will cut this grid off. The same noise pulses, reversed 180°, will appear at grid No. 3. However, since grid No. 1 has cut the current off,

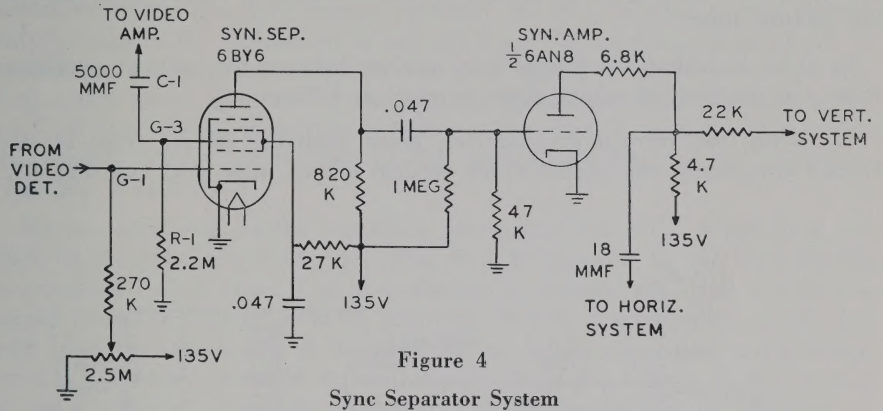


Figure 4

Sync Separator System

nothing will appear in the plate circuit. In this way the 6BY6 suppresses any pulses which arrive stronger than the sync pulses. The pulses received from the 6BY6 by the following triode (½-6AN8) are then amplified and forwarded to the vertical and horizontal deflection systems.

To check out such a system when non-synchronization occurs, we would proceed as follows. With the set in operation, apply a composite sync pulse from the Dyna-Sweep to the plate of the 6AN8 triode. If the picture locks in, reverse the polarity of the sync pulses and apply them to the grid of the same tube. If the circuit is functioning normally, the picture will again become synchronized. Now reverse the polarity of the applied sync pulses again and then touch the probe to grid No. 3 of the 6BY6. If the picture synchronizes, the sync separator system is functioning normally. If the circuit does not permit sync pulses to pass through, trouble in the 6BY6 stage is indicated. While the pulses are being applied to grid No. 3 of the 6BY6, rotate the sync stabilizer control completely counter-clockwise. This places 0 volts on grid No. 1 and permits plate current to flow through the tube.

If injected test pulses at grid No. 3 synchronize the image but the receiver, without the injected sync pulses, still displays the same lack of synchronization, then the path between the 6BY6 and the preceding video system should be checked. Move your probe back component by component, until you reach the video system. An open capacitor, an open resistor or a shorted shunt capacitor will be readily uncovered by this point-to-point tracing method.

The sync pulses delivered by the Dyna-Sweep circuit analyzer are powerful enough to be applied directly to the integrator network leading into the vertical oscillator or to the capacitor leading into the horizontal phase detector. Thus you can trace the signal path from these two deflection systems all the way back to the video amplifier system of the receiver.

HOW TO USE THE DYNA-SWEEP CIRCUIT ANALYZER TO CHECK THE VERTICAL DEFLECTION SYSTEM

The following steps should be taken when checking the vertical deflection systems. We will assume that the indications on the television receiver screen to be tested reveal that there is no vertical driving voltage being delivered to the vertical winding of the deflection yoke resulting in a horizontal line on the picture tube.

In order to isolate the defects in a receiver between the vertical oscillator stage and the vertical output stage, proceed as follows:

1. Using the vertical grid driving pulse available on the front of the Dyna-Sweep, apply this signal to the vertical output stage grid (see Fig. 5).

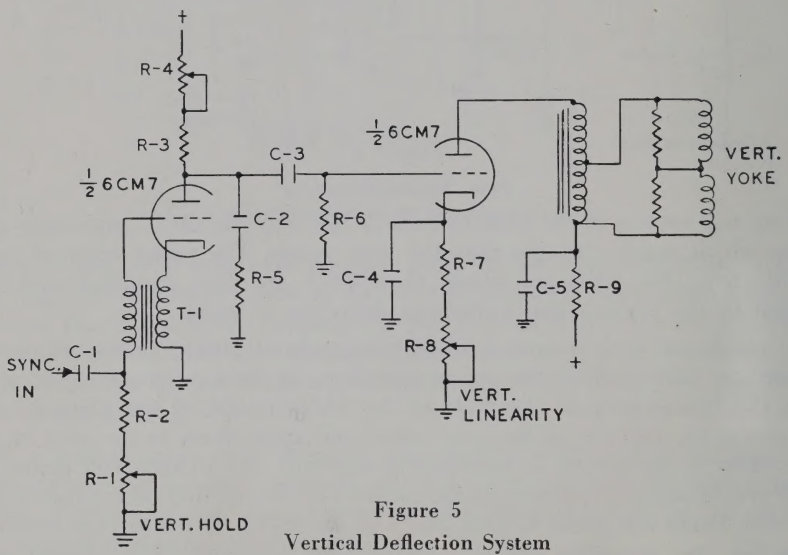


Figure 5
Vertical Deflection System

If, when the signal is applied, the image develops vertical deflection, then we know that the proper driving signal is not being supplied to the output stage by the vertical oscillator. The defect is either in the oscillator itself or in the capacitor coupling the oscillator to the output stage. However, if vertical deflection of the image does not occur when the signal is injected at the grid of the output stage, the defect is located somewhere between this grid and the deflection yoke.

The grid driving pulse signal may not necessarily result in linear deflection on the screen of the television receiver. However, we are primarily interested in the presence or lack of deflection. A closer approach to good linearity can be obtained by adjusting the linearity control in the receiver (R-8 in Fig. 9) and by adjusting the vertical driving pulse amplitude control located on the side of the Model 1075 Television Analyst. In all cases this control should be at maximum when first starting to troubleshoot vertical deflection systems.

2. Inject the vertical plate driving pulse from the Dyna-Sweep at the plate of the vertical output tube. The vertical output tube itself is removed from the set. In sets where the heaters are series-wired, the filament terminals on the socket can be shorted out, so that all the other tubes in the series string will continue to operate.

We are now driving the output transformer from the vertical output stage contained within the Dyna-Sweep. However, the B+ applied to this remote output stage in the instrument is derived from the receiver circuit itself. If vertical deflection is restored with this plate signal, the defect is in the vertical output stage, generally in the cathode circuit, assuming the tube to be good. If the vertical deflection is still missing then it indicates that either the vertical output transformer or the vertical windings of the deflection yoke are at fault.

We are assuming, in the preceding paragraph, that B+ is reaching the plate of the vertical output tube. This B+ is required by the Dyna-Sweep to power its output tube. If no B+ should be present, no signal will be obtained from the PLATE DRIVE terminal. Hence, if application of the test lead from the instrument at the plate of the output stage does not produce vertical deflection, it would be desirable to check the voltage in this circuit to make certain it is present. Absence of the necessary voltage indicates an open circuit in the vertical output transformer winding, or an open resistor or shorted capacitor in the B+ network bringing this voltage to the vertical system.

To check the vertical windings of the deflection yoke, disconnect its wires from the circuit and connect them to the two test leads from the Vertical Yoke Test Signal terminal and GROUND of the Dyna-Sweep. If the yoke is good, vertical deflection of the picture tube image will result. The image will possess poor linearity and overlap or go back on itself (Fig. 6) because

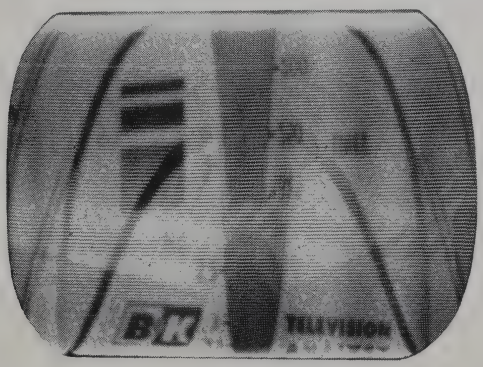


Figure 6
Sweep Developed Using Vertical Yoke Test Signal

the driving signal is a sine wave and not a sawtooth. However, we are not concerned here with checking linearity and, therefore, any indication of deflection would reveal the yoke to be good. The trouble now is definitely indicated to be in the vertical output transformer.

HOW TO USE THE "DYNA-SWEEP ANALYZER" TO TROUBLE SHOOT INTERMITTENTS

The Dyna Sweep Analyzer is a valuable tool to use for trouble shooting an intermittent receiver. The following examples while relating to an intermittent sync condition could just as easily apply to an intermittent sweep problem.

Let us assume that a receiver comes into the shop having intermittent sync. The sync circuit of this receiver is shown in Fig. 3. Since we always trouble-shoot by signal injection from the rear of the signal path, we would inject sync signal from our Sweep Analyzer to the plate of the 6BF6 sync amplifier. We would now observe the raster of the television set and would see that it was in sync.

If the synchronization of the picture did not become intermittent, but remained in sync under all conditions, this would tell us that from the plate of the sync amplifier tube into the oscillator there was no trouble. We would now shift our point of sync injection to the grid of the 6BF6 sync amplifier. At this point we would have to reverse the phase of the sync signal to allow for the phase inversion of the sync amplifier tube and also to reduce the level of the sync signal to take into account the gain of this stage. Again we would observe the picture on the face of the tube and watch for the intermittent trouble to occur. If it did not occur, we would know that there was no difficulty from the grid of this amplifier tube all the way through to the oscillator.

We will now shift our sync signal to the plate of the 6AU6 sync separator and again observe the picture on the face of the CRT. We now find that the intermittent sync condition occurs. This tells us that the trouble lies between the plate circuit of the 6AU6 sync separator and the grid circuit of the 6BF6 sync amplifier. A few voltage and resistance measurements would now certainly point out the trouble. It might even be worth while to replace all of the components that lie between plate of the 6AU6 and the grid of the 6BF6, since this would save a great deal of time and would eliminate the necessity of determining which component is intermittent.

As you can see, this sync injection method for locating intermittents will in every case isolate the trouble to a particular stage. From that point on the repair is very simple.

HOW TO USE THE DYNA-SWEEP CIRCUIT ANALYZER IN CHECKING THE HORIZONTAL DEFLECTION CIRCUIT

We come now to the horizontal circuit of a television receiver and it is here that the instrument offers the service technician several quick test features that will greatly simplify the task of servicing this section of the set.

One such outstanding feature is the ability to check the output circuit completely, both from the grid of the horizontal output tube and from the *plate* of this stage. In essence, then, we can completely bypass the horizontal output tube. A second innovation is two indicator lights which further serve to pin-

point troubles in the output transformer, or the high voltage network. The lights operate on a go, no-go basis, clearly revealing to the serviceman the presence or absence of certain hard-to-find troubles.

And last, but not least, sensitive leakage and shorted-turns tests can be made quickly and conclusively on yokes and horizontal output transformers, again providing the user with positive information.

As a first step in applying the Dyna-Sweep Circuit Analyzer, let us assume the receiver under test has no picture or raster and there is an absence of high voltage.

1. In order to determine if the defect lies between the horizontal oscillator stage and the horizontal output amplifier and the stages following it, proceed as follows:

Using the horizontal grid driving pulse available from the front panel of the Dyna-Sweep apply this signal to the grid of the horizontal output tube. Connect the high voltage indicator lamp to the insulated wire going to the plate cap of the high voltage rectifier tube and remove the plate cap from this tube. See Fig. 7. Apply power to the receiver under test and observe the high

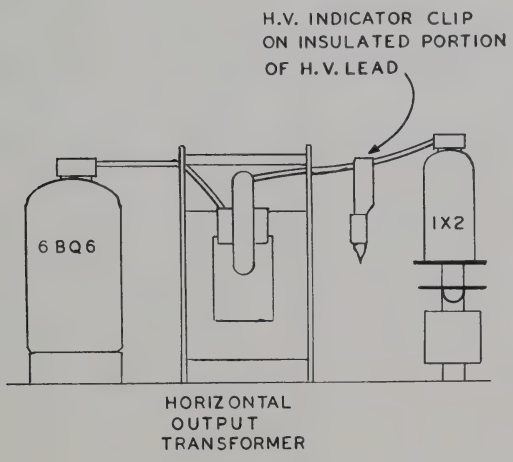


Figure 7

voltage indicator lamp. If the lamp glows this indicates the presence of high level R.F. pulses on this lead. Turn off the power and reconnect the high voltage lead to the rectifier tube and again apply power. The lamp should still remain lit and hi voltage should be present and deflection will be observed on the face of the CRT. Since the application of a driving pulse to the grid of the horizontal output resulted in restoring operation to the receiver the trouble definitely lies in the horizontal oscillator circuit. A few voltage and resistance checks will certainly bring the trouble to light.

Let us take another case where no hi voltage is again the trouble. Application of grid driving pulses did not restore hi voltage or deflection. This indicates that the trouble is not in the horizontal oscillator but that the difficulty

lies in the output circuit of the receiver. Turn the selector switch of the Dyna-Sweep to the Horizontal Plate Drive position. Connect the ground lead of the instrument to chassis ground or B— and connect a test lead from the plate drive jack to the plate lead connection on the horizontal output transformer. Be sure the hi voltage indicator lamp is connected to the plate cap lead going to the hi voltage rectifier and that this lead is removed from the plate cap of the tube. Apply power to the receiver and observe the B+ boost indicator lamp on the front of the Dyna-Sweep and the hi voltage indicator.

If both the B+ boost indicator and the hi voltage indicator lamps come on, they indicate the presence of boost voltage in the flyback system and hi level R.F. pulses in the hi voltage lead. Both of these indications tell us that the flyback system is now operating properly. The trouble must be in either the high voltage rectifier circuit or the output tube circuit. To eliminate the hi voltage circuit, reconnect the plate cap of the hi voltage rectifier tube, apply power to the receiver, and again observe the boost indicator and the hi voltage indicator. If both are lit this proves conclusively that the trouble is associated with the few components connected to the horizontal output tube such as the screen resistor R_1, or by-pass condenser C_1, or the cathode bias resistor R_3. (See Fig. 8.)

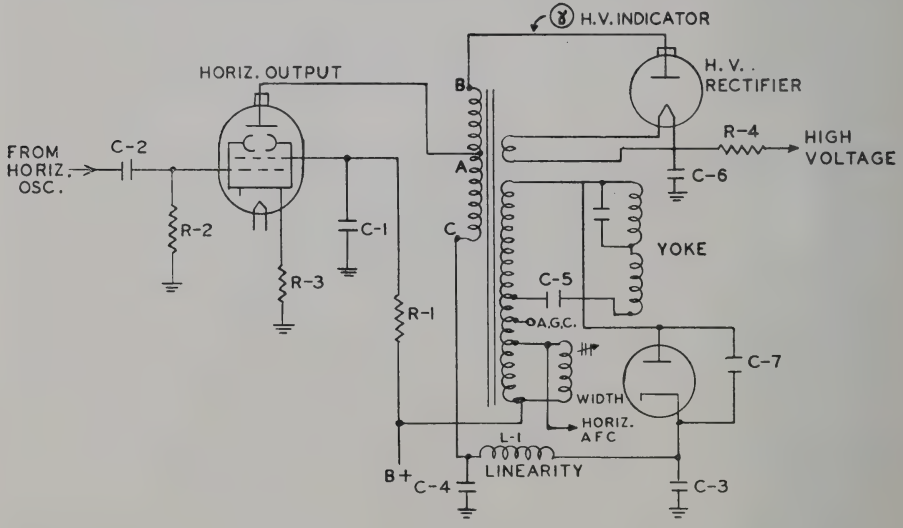


Figure 8

A horizontal output section using an isolation type of output transformer.

Screen voltage is applied to the horizontal output tube through the screen dropping resistor R-1. There is also a bypass capacitor C-1 between the screen grid and ground. If resistor R-1 increases in value, the screen voltage will decrease, there will be less drive to the horizontal output transformer, and the picture width will decrease. If R-1 opens up, there will be no drive and no high voltage. Generally, if R-1 is open it will be found that capacitor C-1 has shorted and the excessive current drain has caused R-1 to burn out. In this case, both C-1 and R-1 should be replaced. As a matter of prudence,

whenever R-1 has been found to increase in value substantially, it is good practice to change capacitor C-1 because it frequently is the cause of such resistance change.

In the grid circuit of the horizontal output stage, grid leak resistor R-2 and coupling capacitor C-2 bring the signal to the horizontal output stage from the horizontal oscillator. This coupling capacitor is frequently the cause of much difficulty in the horizontal output circuit. If C-2 becomes leaky or shorted, a positive voltage will be applied to the control grid of the horizontal output stage from the plate circuit of the oscillator. If the leakage resistance of C-2 is low enough, this could load down the horizontal oscillator circuit sufficiently to prevent any horizontal output or high voltage from being developed.

It is interesting to note that if C-2 is leaky, with a fairly low resistance, applying the grid driving pulse to the horizontal output stage from the Analyst may not cause the high voltage to reappear since the shorted coupling capacitor will load down the Analyst circuit as well. To see if this is so, uncouple one side of C-2 and reapply the grid drive. If the high voltage now appears, capacitor C-2 should be changed.

2. If you find that injecting the signal from the Dyna-Sweep at the plate of the horizontal output tube *does not* restore high voltage, then the trouble lies somewhere in the circuit *beyond* the horizontal output stage. NOTE: This is a *conclusive* test and is due *entirely* to the fact that the Dyna-Sweep can take the place of the horizontal output amplifier.

The procedure to check out the output circuit with the instrument is as follows:

The cap lead is lifted from the top of the horizontal output tube; also the cap lead connecting to the high voltage rectifier is removed from its tube. As an added precaution, the high voltage rectifier tube is removed from its socket. The Dyna-Sweep is then set to deliver a horizontal plate driving pulse. The lead from the plate drive terminal is connected to the cap lead that ordinarily goes to the horizontal output amplifier. Next, the B & K high voltage indicator light is attached directly to the *insulated* wire leading to the cap that connects to the high voltage rectifier. The instrument and the television receiver are both turned on.

If the boost indicator light on the panel of the Dyna-Sweep lights up, as well as the high voltage indicator, high voltage is being developed, boost B+ is present, and R.F. (15,750 cycles) is being produced in the circuit. This is the condition that would generally be obtained when the set is working normally. In the present instance, the set is presumed to be defective; therefore, if such an indication is obtained, but there is no high voltage on the picture tube as indicated by lack of raster, it is possible that capacitor C-6 in Fig. 5 may be shorted, or the high voltage cable is not connected to the CRT. (We are assuming that all the tubes in the circuit have previously been checked before any testing with the instrument is begun.)

Another possible cause of no raster when the hi voltage indicator lights up is an open in the current limiting resistor R-4, preventing any high volt-

age from appearing on the picture tube. Each of these components can be checked individually to determine which is defective.

If the boost indicator lights up when the horizontal plate drive is applied to the transformer but the hi voltage indicator *does not* and there is no high voltage, then we have a definite indication that the trouble is in the transformer winding from point A to point B in Fig. 8.

NOTE: For the boost indicator to light up, R.F. (15,750 cycles) pulses must be present on the plate of the horizontal output tube. This, in turn, means that boost B+ must be present, for without this additional voltage, any R.F. pulses produced will be too weak to light up the boost indicator. This makes the boost indicator doubly valuable because it provides a positive indication of whether the circuit is or is not operating.

3. If neither the boost indicator or the high voltage indicator light up, when the horizontal plate driving pulse is applied to the transformer, we proceed in the following manner:

With a voltmeter, check the DC voltage at the plate of the horizontal output tube. We know that boost B+ is absent and this test is designed to reveal if any B+ is reaching the tube. If zero voltage is measured at this point, then either the voltage is being shorted out by boost filter capacitors C-3 and C-4 or the linearity coil L-1 is open. Short out the linearity coil and test the circuit again. If everything returns to normal, the linearity coil is open. If no change occurs we can presume that the coil is OK.

Check capacitors C-3 and C-4 for any short or leakages. It should be noted here that a failure of the boost B+ voltage being applied to transformer terminal C will cause very little horizontal output signal because the output tube does not have enough plate voltage. This is because the boost B+ voltage is providing the power for the plate of the horizontal output stage.

Returning to the damper circuit, if B+ voltage only is measured on the boost B+ line, it indicates that no high pulse voltage is being rectified and added to the B+ to develop a boost B+ voltage. There is another boost circuit defect which can cause this and that occurs when capacitor C-7 (Fig. 8) is shorted. For this condition, the B+ voltage will be applied from the plate of the damper tube to the cathode; there will be no rectification in the damper tube and hence no boost B+ voltage. This possibility can be checked by removing the damper tube from its socket and nothing whether the B+ voltage is still being measured at the cathode terminal of the damper tube socket. If the answer is yes, C-7 is shorted and should be replaced. However, if no voltage is present at the cathode of the damper tube with the tube out of its socket, then C-7 is not shorted and the damper tube can be returned to its socket.

The role played by the two special indicator lamps provided with the Dyna-Sweep Circuit Analyzer demonstrates how useful they are in assisting the technician isolate a defect in the horizontal output circuit. Once their use becomes understood, they will be found to save many hours of service work.

4. We shall now demonstrate how to locate quickly a defect in the horizontal output system consisting of the transformer itself, the horizontal yoke or any of the associated components attached to these units. To check the horizontal yoke, it is only necessary to disconnect the yoke from the circuit so that any shorting effect a defective yoke might have on the rest of the circuit is removed. If now, with the plate drive signal applied to the horizontal output transformer, the boost indicator lights up as well as the hi voltage indicator showing that high voltage is being produced, then the defect in the set has been isolated to a shorted yoke. As a matter of fact, a vertical white line will appear on the screen of the TV receiver being tested, if the high voltage rectifier has been replaced in its socket. However, if the yoke is not the defective component, there will be no change in indications at this time.

Make careful note where the yoke wires connect in the circuit. Also keep the yoke disconnected while the remaining tests are being made.

Next, the width coil is tested. To do this, it is disconnected completely from the circuit. Note the effect upon the boost indicator and hi voltage lights. If the width coil is defective, its removal from the circuit will bring back the high voltage. Under these conditions, both the B+ boost indicator and hi voltage indicator will light up. If the width coil is in series with the yoke in a particular circuit, remove the width coil at the same time the yoke is being removed. If the high voltage comes back again, one of these components is at fault. Reconnect the yoke first, using a connecting lead in place of the width coil. If the high voltage reappears, the width coil is the defective component. If the high voltage does not show up, the yoke is the defective unit. This conclusion can be checked out by testing the yoke with the Dyna-Sweep.

It is common practice to tap off pulses from various points on the secondary of the horizontal output transformer for use in the horizontal AFC and in keyed A.G.C. circuits. It may very well be that a defect exists in one of these auxiliary circuits which is having an adverse affect on the horizontal output transformer, loading it down and thereby preventing it from functioning normally. To determine if this is true here, disconnect one tap at a time, each time checking the circuit to see whether high voltage can be reobtained. If the boost and high voltage indicators light up after one of these leads have been disconnected, then we know that the trouble exists in that particular auxiliary circuit. After this, it simply becomes a matter of tracking down the defect in the auxiliary circuit.

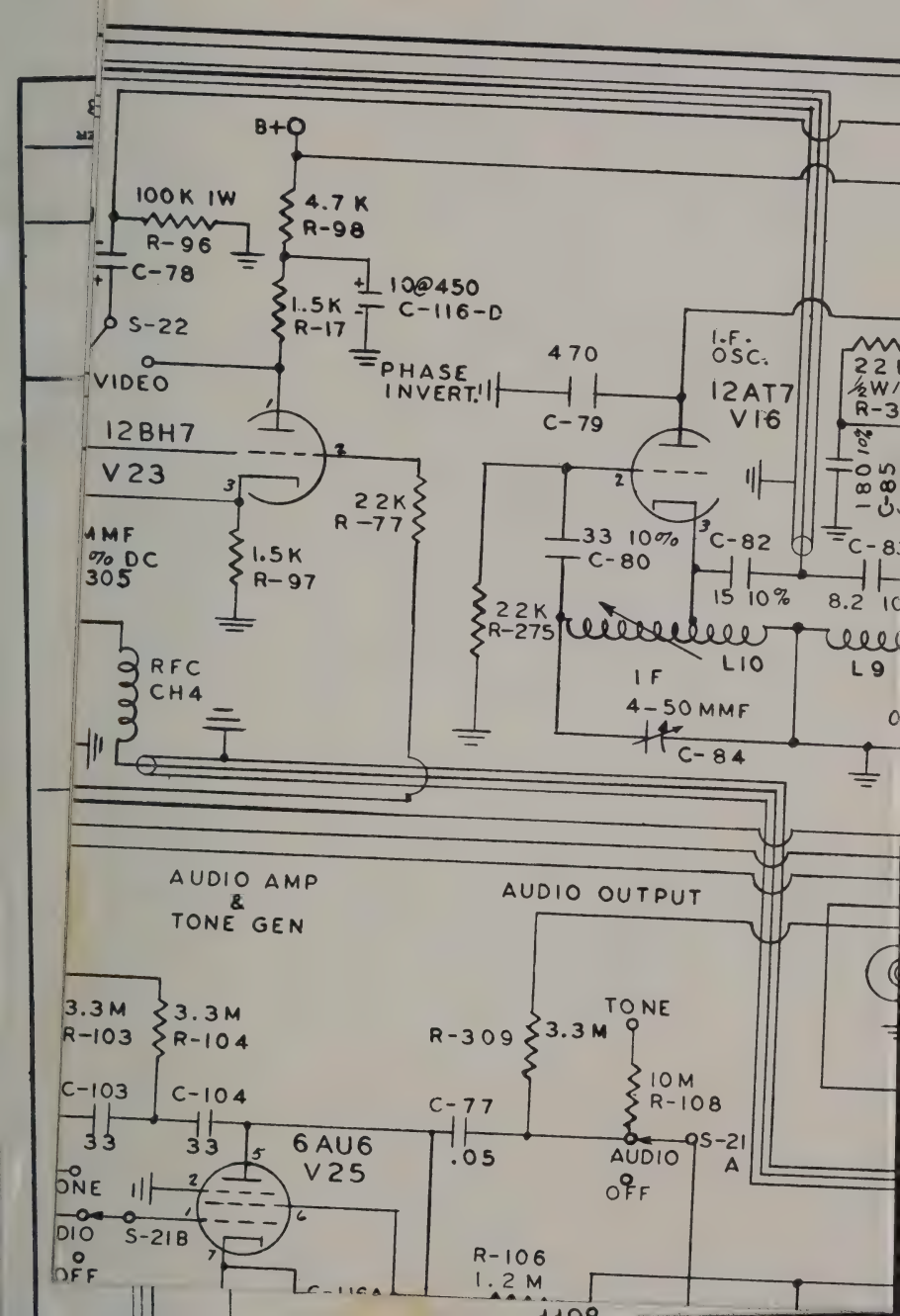
It may happen that even after all of the auxiliary components have been removed from the horizontal output transformer neither the boost or hi voltage indicators will light. This certainly points to a defective transformer and the Dyna-Sweep has available the necessary tests to prove that the transformer is defective. At this point it might well be worthwhile to review the nature of defects that can occur in a horizontal output transformer. Some of the more obvious defects that can occur are open windings, shorts from one winding to another, hi resistance leakage from one winding to another or from a winding to the core of the transformer. The instrument provides a

test for these conditions. There is another fault that is less obvious. A flyback transformer in operation is subject to both very high voltage pulses and relatively high temperatures. This can cause breakdown between turns in a winding resulting in one or two or more shorted turns within the winding of the transformer. These shorted turns represent a load on the flyback and a serious reduction in the "Q" of the whole system. As few as one shorted turn in a winding can result in an inoperative flyback system. These leakages and shorted turns can also occur in the horizontal windings of the deflection yoke and all of these tests are equally applicable to both. To test these components they must be completely disconnected from the circuit. To test for leakage or continuity the selector switch must be in the Flyback-Yoke position and the Calibrate control turned to the leakage-cont. position, which is fully counter clockwise. Connect the test leads to the Leakage Continuity jack and check continuity of the various windings. Presence of continuity is shown by a glow of the test indicator bulb. When measuring leakage between windings and from winding to core a glow of the test indicator shows that leakage is present. The leakage test will show leakages of 10 megohms or more.

To test a transformer for shorted turns connect the shielded cable to the Flyback-Yoke test signal jack. Adjust the Calibrate control until the test indicator lamp goes out. Connect the flyback transformer to this cable. The connection is made from horizontal output plate cap connector to hi voltage rectifier plate cap connector. If the test indicator glows this indicates that the transformer has shorted turns. This test will respond to as little as one shorted turn. If the component to be tested is the horizontal winding of the deflection yoke, connection is made across the deflection yoke winding. It is also impotrant to test the yoke for leakage between the vertical and horizontal winding and from the horizontal winding to the metal frame of the yoke.

Another very common arrangement is the autotransformer shown in Fig. 9. Here there is one winding to which all taps are made. The horizontal output tube is connected at point A and the stepped-up voltage for the high voltage rectifier tube is obtained from point B. Horizontal deflection yoke coils are connected across points C, D and E. All of the testing methods just outlined for the isolation horizontal output transformer are applicable here, too. The boost indicator and hi voltage still function as before, for the same conditions, and both are connected as before. The ability of the instrument to check for continuity can be put to good use here because continuity should exist between all points on the transformer. If continuity is not obtained, the circuit is open.

In Fig. 9 L-1 serves primarily as a filter coil. If this component should open, no B+ would be available to the horizontal output tube, and if L-1 was shorted, the circuit would still operate normally; however, it is quite possible that considerable RF interference would appear in the picture. If no interference did appear, there would be no visual indication of a short in L-1. If C-1 should short, the damping tube would be effectively cut out of the circuit and no boost B+ would be developed. B+ voltages, however,


B+
100K 1W
R-96
4.7 K
R-98
C-78
S-22
VIDEO
1.5K
R-17
10@450
C-116-D
PHASE
INVERT.
470
C-79
I.F.
OSC.
12AT7
V16
12BH7
V23
22K
R-77
1.5K
R-97
RFC
CH4
33 10%
C-80
C-82
15 10%
22K
R-275
L10
L9
I F
4-50 MMF
C-84
AUDIO AMP
&
TONE GEN
AUDIO OUTPUT
3.3M
R-103
3.3M
R-104
C-103
33
C-104
33
6AU6
V25
TONE
R-309
3.3M
10M
R-108
C-77
.05
AUDIO
OFF
S-21
A
S-21B
R-106
1.2 M

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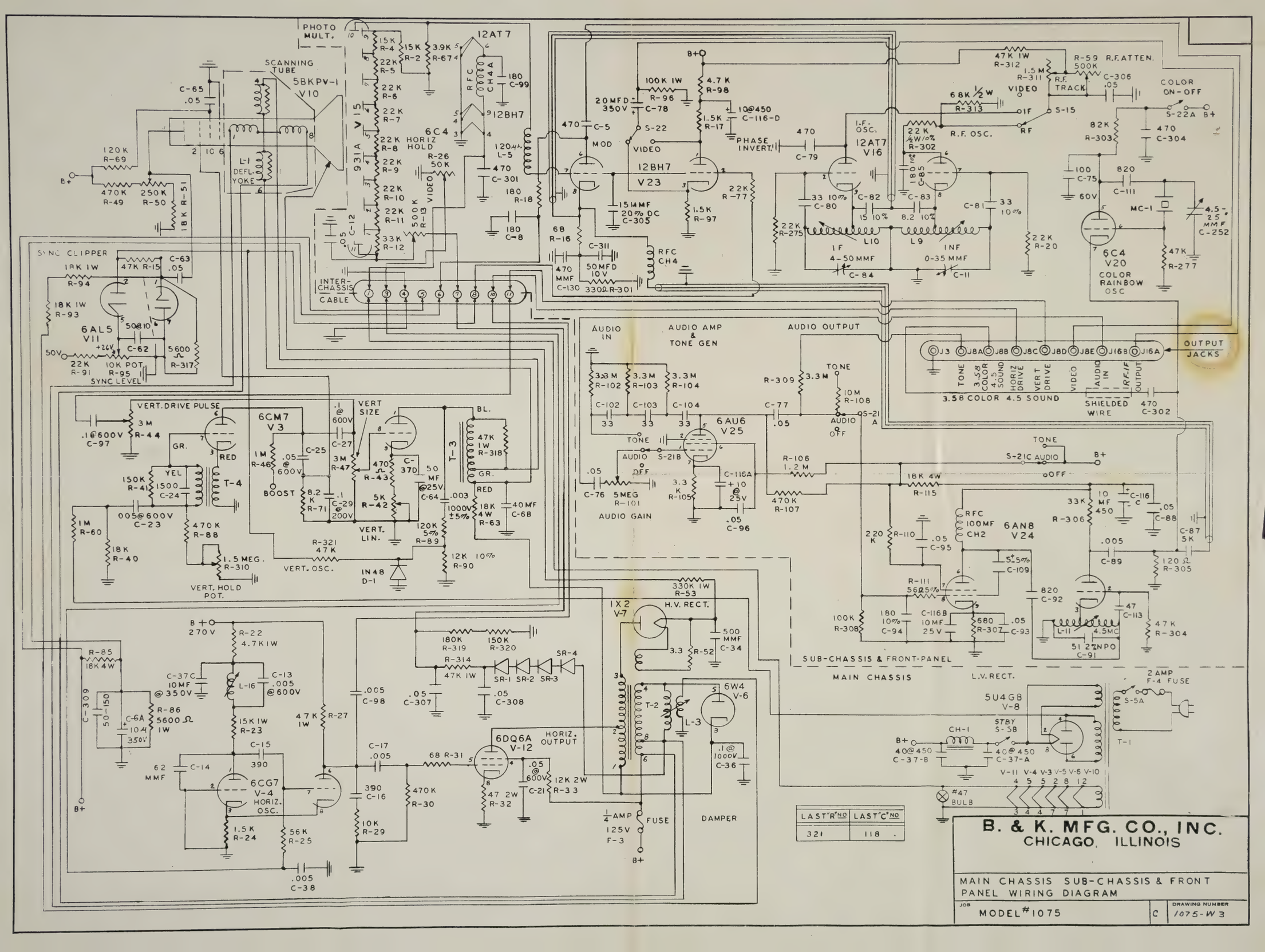
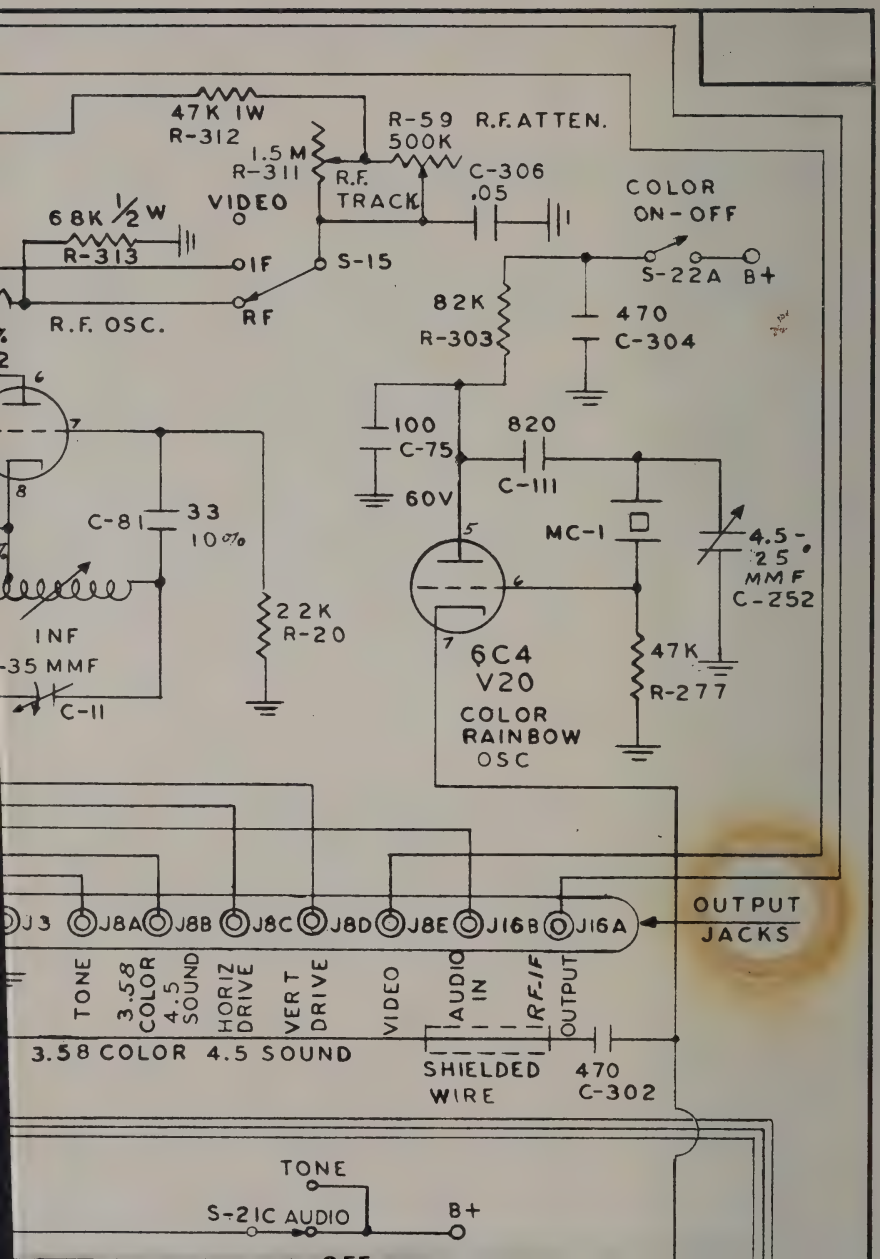


LAST "R" NO	LAST "C" NO
321	118

B. & K. MFG. CO., INC.
CHICAGO, ILLINOIS

MAIN CHASSIS SUB-CHASSIS & FRONT PANEL WIRING DIAGRAM

JOB MODEL #1075 | C | DRAWING NUMBER 1075-W3


47K 1W
R-312
1.5 M
R-311
R-59 R.F. ATTEN.
500K
R.F. TRACK
C-306
.05
VIDEO
68K 1/2 W
R-313
IF
S-15
RF
R.F. OSC.
COLOR ON-OFF
S-22A B+
82K
R-303
470
C-304
100
C-75
820
C-111
60V
MC-1
4.5-25 MMF
C-252
C-81
33
10%
22K
R-20
INF
-35 MMF
C-11
6C4
V20
COLOR RAINBOW OSC
47K
R-277
J3 J8A J8B J8C J8D J8E J16B J16A
OUTPUT JACKS
TONE
3.58 COLOR
4.5 SOUND
HORIZ DRIVE
VERT DRIVE
VIDEO
AUDIO IN
IRF-IF OUTPUT
3.58 COLOR 4.5 SOUND
SHIELDED WIRE
470
C-302
TONE
S-21C AUDIO
B+

would appear on the boost B+ line and at the plate of the horizontal output tube. If C-1 should open, it would have very little effect on overall operation, although here, again, RF interference might appear in the image.

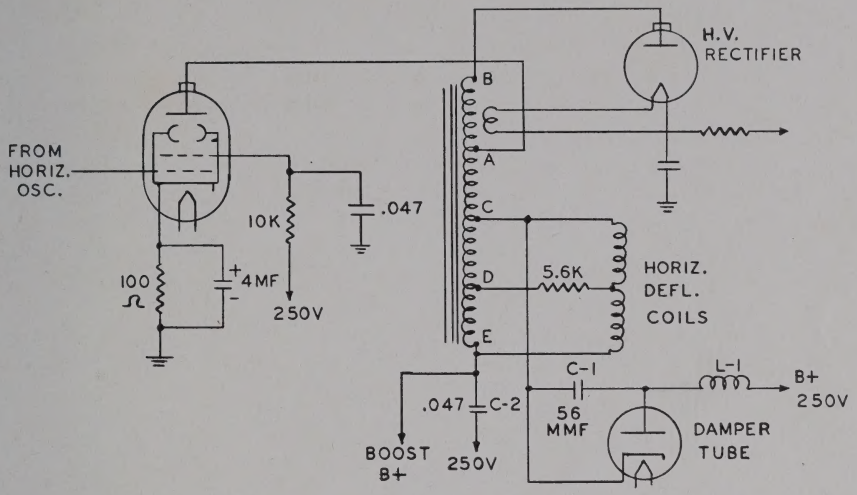


Figure 9

A Horizontal Output Section using an Auto Transformer type of output transformer.

Capacitor C-2 is the component receiving the additional voltage which the damper tube develops. If C-2 should short, no boost B+ could be developed by the circuit and it would prevent the development of the normal amount of high voltage or the normal amount of horizontal drive for the yoke. If C-2 should open, the circuit would again be disrupted by the lack of boost B+ voltage. B+ voltage, however, would still appear because the damper tube and L-1 would still be intact.

The foregoing examples indicate the complete flexibility of this instrument. With continuous use the technician will certainly develop his own procedure which will completely remove all of the complexities of Sweep Circuit Analyzing.

B & K MODEL 1075 TELEVISION ANALYST
CIRCUIT PARTS LIST

CAPACITORS

DESCRIPTION		B & K PART No.
C-5	470 MMF @ 500V 20% Disc. Ceramic	CC-471-500-20
C-6	40-10 MFD @ 450-350 WVDC Electrolytic Cap.	CL-40-10-450-350
C-8	180MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-181-500-10
C-11	0-35 MMF @ Air Trimmer R.F. TUNING Condenser	CV-0-35
C-12	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-13	.005 @ 600 WVDC Paper Capacitor	CP-A005-600
C-14	62 MMF @ 500 WVDC Disc. Ceramic Cap. 20%	CC-62-500-20
C-15	390 MMF @ 500 WVDC plus or minus 5% Mica Capacitor	CM-391-500-5
C-16	390 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-391-500-20
C-17	.005 MFD @ 500 WVDC disc. Ceramic Cap. 20%	CC-A005-500-20
C-21	.05 @ 600 WVDC Paper Capacitor	CP-A05-600
C-23	.005-600 WVDC Paper Capacitor	CP-A005-600
C-24	1500 MMF @ 500 WVDC Disc. Ceramic Cap. 10%	CC-152-500-10
C-25	.05 @ 600 WVDC Paper Capacitor	CP-A05-600
C-27	.1 @ 600 WCDC Paper Capacitor	CP-A1-600
C-29	.1 @ 200 WVDC Paper Capacitor	CP-A1-200
C-34	500 MMF @ 20 KV Ceramic Capacitor	CC-501-20KV
C-36	.1 @ 1000 WVDC Paper Capacitor	CP-A1-1000
C-37	40-40-10-50 MFD @ 450-450-350-25 WVDC Electrolytic Capacitor	CL1
C-38	.005 MFD @ 500 WVDC Disc. Ceramic Cap. 20%	CC-A005-500-20
C-62	50 MFD 10V Elec. Cap.	CL-50-10
C-63	.05 MFD @ 500 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-500-20
C-64	.003 MFD @ 1000 WVDC plus or minus 5% Disc. Ceramic Capacitor	CC-A003-1000-5
C-65	.05 MFD @ 500 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-500-20
C-75	100 MMFD 500V 10% Disc. Ceramic Capacitor	CC-101-500-10
C-76	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-77	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-78	20 MFD @ 350 WVDC Electrolytic Capacitor	CL-20-350
C-79	470 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-471-500-20
C-80	33 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-33-500-10
C-81	33 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-33-500-10
C-82	15 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-15-500-10
C-83	8.2 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-8A2-500-10
C-84	4-50 MMF Air Trimmer I.F. TUNING Condenser	CV-4-50
C-85	180 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-181-500-10
C-87	.005 MFD 500V 20% Disc. Ceramic Capacitor	CC-A005-500-20
C-88	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic	CC-A05-600-20
C-89	.005 MFD @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-A005-500-20
C-91	50 MMFD @ 600 WVDC plus or minus 2% Tubular Ceramic Capacitor	CC-50-600-2
C-92	820 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-821-500-20
C-93	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-94	180 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-181-500-10
C-95	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-96	.05 MFD @ 600 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-97	.1 @ 600 WVDC Paper Capacitor	CP-A1-600
C-98	.005 MFD @ 500 WVDC plus or minus 20% Disc. Ceramic Capacitor	CC-A005-500-20
C-99	180 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-181-500-10
C-102	33 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-33-500-10
C-103	33 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-33-500-10
C-104	33 MMF @ 500 WVDC plus or minus 10% Disc. Ceramic	CC-33-500-10
C-109	5 MMF @ 500 WVDC plus or minus 5% Silver Mica Capacitor	CM-5-500-5
C-111	820 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-821-500-20
C-113	47 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-47-500-20
C-116	10-10-10-10 MFD Twist Lug, 25-25-450-450 WVDC Electrolytic Capacitor	CL-10-10-10-10 25-25-450-450
C-130	470 MMF @ 500V 20% Disc. Ceramic	CC-471-500-20
C-252	4.5-25 MMF Air Trimmer	CV-4.5-25
C-301	470 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-471-500-20
C-302	470 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-471-500-20
C-304	470 MMF @ 500 WVDC plus or minus 20% Disc. Ceramic	CC-471-500-20
C-305	15 MMFD @ 500V plus or minus 20% Disc. Ceramic Capacitor	CC-15-500-20
C-306	.05 MFD @ 600V plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-307	.05 MFD 600V plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-308	.05 MFD 600V plus or minus 20% Disc. Ceramic Capacitor	CC-A05-600-20
C-309	50 MFD @ 150V Elec. Cap.	CL-50-150
C-311	50 MFD @ 10V Elec. Cap.	CL-50-10

RESISTORS

R-2	15K ½W 10% Carb. Resistor	RC-153-A-10
R-4	15K ½W 10% Carb. Resistor	RC-153-A-10
R-5	22K ½W 10% Carb. Resistor	RC-223-A-10
R-6	22K ½W 10% Carb. Resistor	RC-223-A-10
R-7	22K ½W 10% Carb. Resistor	RC-223-A-10
R-8	22K ½W 10% Carb. Resistor	RC-223-A-10
R-9	22K ½W 10% Carb. Resistor	RC-223-A-10
R-10	22K ½W 10% Carb. Resistor	RC-223-A-10
R-11	22K ½W 10% Carb. Resistor	RC-223-A-10
R-12	33K ½W 10% Carb. Resistor	RC-333-A-10
R-13	500K ¼W Pot. Linear Taper VIDEO	P-5
R-15	47K ½W —10% Carb. Resistor	RC-473-A-10
R-16	68 Ohm ½W 10% Carb. Resistor	RC-680-A-10
R-17	1500 Ohm ½W 10% Carb. Resistor	RC-152-A-10
R-18	180 Ohm ½W 10% Carb. Resistor	RC-181-A-10
R-20	22K ½W 10% Carb. Resistor	RC-223-A-10
R-22	4.7K 1W 10% Carb. Resistor	RC-472-B-10
R-23	15K 1W 10% Carb. Resistor	RC-153-B-10
R-24	1.5K ½W 10% Carb. Resistor	RC-152-A-10
R-25	56K ½W 10% Carb. Resistor	RC-563-A-10
R-26	50K ¼W Pot. HORIZONTAL HOLD	P-11
R-27	47K 1W 10% Carb. Resistor	RC-473-B-10
R-29	10K ½W 10% Carb. Resistor	RC-103-A-10
R-30	470K ½W 10% Carb. Resistor	RC-474-A-10
R-31	68 Ohm ½W 10% Carb. Resistor	RC-680-A-10
R-32	47 Ohm 2W 10% Carb. Resistor	RC-470-C-10
R-33	12K 2W 10% Carb. Resistor	RC-123-C-10
R-40	18K ½W 10% Carb. Resistor	RC-183-A-10

B & K MODEL 1075 TELEVISION ANALYST
CIRCUIT PARTS LIST

DESCRIPTION		B & K PART No.
R-41	150K ½W 10% Carb. Resistor	RC-154-A-10
R-42	5K ½W Pot. VERT. LIN.	P-9A
R-43	470 Ohm 1W 10% Carb. Resistor	RC-471-B-10
R-44	3 Meg. ¼W Pot. VERT. DRIVE PULSE	P-8A
R-46	1 Meg. ½W 10% Carb. Resistor	RC-105-A-10
R-47	3 Meg. ¼W Pot. VERT. SIZE	P-8A
R-49	470K ½W 10% Carb. Resistor	RC-474-A-10
R-50	250K ¼W Pot. BEAM CURRENT	P-12A
R-51	18K ½W 10% Carb. Resistor	RC-183-A-10
R-52	3.3 Ohm 1W 10% Carb. Resistor	RC-3A3-B-10
R-53	330K 1W 10% Carb. Resistor	RC-334-B-10
R-59	500K ¼W Pot. R.F. ATTENUATOR	P-5
R-60	1 Meg. ½W 10% Carb. Resistor	RC-105-A-10
R-63	18K 4W plus or minus 10% Glass Resistor	RG-183-4-10
R-67	3900 Ohm ½W 10% Carb. Resistor	RC-392-A-10
R-69	120K ½W 10% Carb. Resistor	RC-124-A-10
R-71	8.2K ½W plus or minus 10% Carb. Resistor	RC-822-A-10
R-77	22K ½W 10% Carb. Resistor	RC-223-A-10
R-85	18K 4W plus or minus 10% Glass Resistor	RG-183-4-10
R-86	5600 Ohm 1W 10% Carb. Resistor	RC-562-B-10
R-88	470K ½W 10% Carb. Resistor	RC-474-A-10
R-89	120K ½W plus or minus 5% Carb. Resistor	RC-124-A-5
R-90	12K ½W 10% Carb. Resistor	RC-123-A-10
R-91	22K ½W 10% Carb. Resistor	RC-223-A-10
R-93	18K 1W 10% Carb. Resistor	RC-183-B-10
R-94	18K 1W 10% Carb. Resistor	RC-183-B-10
R-95	10K ¼W Pot. SYNC. LEVEL	P-27A
R-96	100K 1W plus or minus 10% Carb. Resistor	RC-104-B-10
R-97	1500 Ohm ½W 10% Carb. Resistor	RC-152-A-10
R-98	4700 Ohm ½W 10% Carb. Resistor	RC-472-A-10
R-101	5 Meg. ¼W Pot. AUDIO GAIN	P-24
R-102	3.3 Meg. ½W 10% Carb. Resistor	RC-335-A-10
R-103	3.3 Meg. ½W 10% Carb. Resistor	RC-335-A-10
R-104	3.3 Meg. ½W 10% Carb. Resistor	RC-335-A-10
R-105	3300 Ohm ½W 10% Carb. Resistor	RC-332-A-10
R-106	1.2 Meg. ½W 10% Carb. Resistor	RC-125-A-10
R-107	470K ½W 10% Carb. Resistor	RC-474-A-10
R-108	10 Meg. ½W 10% Carb. Resistor	RC-106-A-10
R-110	220K ½W 10% Carb. Resistor	RC-224-A-10
R-111	56 Ohm ½W 5% Carb. Resistor	RC-560-A-5
R-115	18K 4W plus or minus 10% Glass Resistor	RG-183-4-10
R-275	22K ½W 10% Carb. Resistor	RC-223-A-10
R-277	47K ½W 10% Carb. Resistor	RC-473-A-10
R-301	330 ½W 10% Carb. Resistor	RC-331-A-10
R-302	22K ½W 10% Carb. Resistor	RC-223-A-10
R-303	82K ½W 10% Carb. Resistor	RC-823-A-10
R-304	47K ½W 10% Carb. Resistor	RC-473-A-10
R-305	120 Ohm ½W 10% Carb. Resistor	RC-121-A-10
R-306	33K ½W 10% Carb. Resistor	RC-333-A-10
R-307	680 Ohm ½W 10% Carb. Resistor	RC-681-A-10
R-308	100K ½W 10% Carb. Resistor	RC-104-A-10
R-309	3.3 Meg. ½W 10% Carb. Resistor	RC-335-A-10
R-310	1.5 Meg. ¼W Pot. VERT. HOLD	P-42A
R-311	1.5 Meg. ¼W Pot. R.F. TRACKING	P-42A
R-312	47K 1W 10% Carb. Resistor	RC-473-B-10
R-313	68K ½W 10% Carb. Resistor	RC-683-A-10
R-314	47K 1W 10% Carb. Resistor	RC-473-B-10
R-317	5600 1W 10% Carb. Resistor	RC-562-B-10
R-318	47K 1W 10% Carb. Resistor	RC-473-B-10
R-319	180K ½W 10% Carb. Resistor	RC-184-A-10
R-320	150K ½W 10% Carb. Resistor	RC-154-A-10
R-321	47K ½W 10% Carb. Resistor	RC-473-A-10

CHOKES — COILS — TRANSFORMERS

CH-1	Filter Choke	CH-1
CH-2	100 UH Iron Core Choke	CH-2
CH-4, CH-4A	R.F. Choke	CH-4
L-1	Yoke	L-1
L-3	Width Coil	L-3
L-16	Ringing Coil	L-16
L-5	120 Micro Henry Peaking Coil	L-5
L-9	R.F. Oscillator Coil	L-9
L-10	I.F. Oscillator Coil	L-10
L-11	Oscillator Coil 4.5 MC	L-11
T-1	Power Transformer (60 cycle)	TP-2
T-2	Horizontal Output Transformer	TFL-1
T-3	Vertical Output Transformer	TA-1
T-4	Vertical Block Transformer	TO-1

SWITCHES

S-5	OFF-ON Selector Switch	S-5
S-15	1 pole 3 Pos. Switch R.F. I.F. VIDEO	S-15
S-21	Selector Switch OFF-AUDIO-TONE	S-21
S-22	S.P.D.T. Slide Switch VIDEO POLARITY	S-22
S-22A	S.P.D.T. Slide Switch COLOR ON-OFF	S-22

MISCELLANEOUS

	Front Panel	A-9
	Slide Mech. Assembly	A-25
	Case	A-29
	Slide Holder	A-30
	Yoke Bracket	A-32
	Fuse Holder	F-1
F-3	Fuse ¼ Amp., Slo-Blo with Pigtails	F-3
F-4	2 Amp. Line Fuse, Slo-Blo	F-4
	CRT Socket	G-CRT
	Binder Post 1½ (Slide Mech. Lever)	H-20
	CRT Rubber Stripping	H-41
	Centering Device	H-71
	Nylon Tip Jack (black)	J-3
DI	In-48 Diode	D-IN-48
J-8A, 8B, 8C 8D and J8-E	Nylon Tip Jack (red)	J-8
J-16A, 16B	Mike Jack	J-16
	1″ Knob	K-3
	¾″ Knob	K-9
	Ion Trop 35 Gauss	M-2
MC-1	3.563795 MC Crystal, 3/32″ Mtg. Pins, .486″ Spacing	C-1
	Instruction Book	PM-94
	Control Labels—2	PM-97
PL-3	No. 47 Bulb	PL-3
	ASM-12 Slide Kit (consists of:)	
	Dot Slide	PM-6
	Line Slide	PM-7
	Clear Slide	PM-8
	Analyst Pattern	PM-95
	Complete Probe Assembly	ASM-20
	Set of Leads (1 red and 1 black) only	ASM-20-8
	Slip on Alligator Clip only	ASM-20-9
	R.F.I.F. Cable only	ASM-20-10
	Adaptor Probe with Hook on Tip only	ASM-20-H-143
SR-1, 2, 3, 4	65 Ma Sel. Rect. no Mtg. Foot	E-65

TUBES

V-3	6CM7 Tube	V-6CM7
V-4	6CG7 Tube	V-6CG7
V-6	6W4GT Tube	V-6W4GT
V-7	1X2B Tube	V-1X2B
V-8	5U4GB Tube	V-5U4GB
V-10	5BKPV1 Tube	V-5BKPV1
V-11	6AL5 Tube	V-6AL5
V-12	6DQ6A Tube	V-6DQ6A
V-15	931A Tube	V-931A
V-16	12AT7 Tube	V-12AT7
V-20	6C4 Tube	V-6C4
V-23	12BH7 Tube	V-12BH7
V-24	6AN8 Tube	V-6AN8
V-25	6AU6 Tube	V-6AU6

would appear on the boost B+ line and at the plate of the horizontal output tube. If C-1 should open, it would have very little effect on overall operation, although here, again, RF interference might appear in the image.

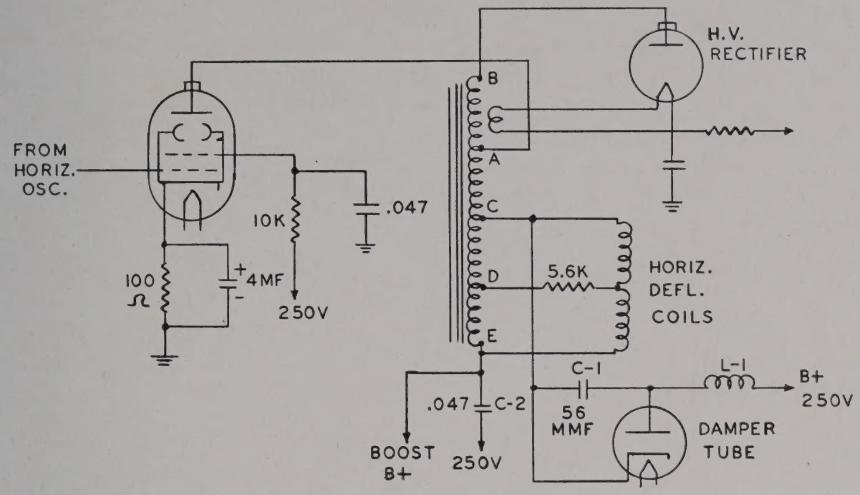


Figure 9

A Horizontal Output Section using an Auto Transformer type of output transformer.

Capacitor C-2 is the component receiving the additional voltage which the damper tube develops. If C-2 should short, no boost B+ could be developed by the circuit and it would prevent the development of the normal amount of high voltage or the normal amount of horizontal drive for the yoke. If C-2 should open, the circuit would again be disrupted by the lack of boost B+ voltage. B+ voltage, however, would still appear because the damper tube and L-1 would still be intact.

The foregoing examples indicate the complete flexibility of this instrument. With continuous use the technician will certainly develop his own procedure which will completely remove all of the complexities of Sweep Circuit Analyzing.

WARRANTY

Your B&K DYNA-SWEEP CIRCUIT ANALYZER is made of the finest material and then carefully tested at the factory before shipment. It carries the standard RETMA warranty against defects in material and workmanship for a period of 90 days from date of purchase. Should any defect be discovered within this warranty period, return the unit to the distributor from whom it was purchased.

BE SURE TO MAIL YOUR WARRANTY REGISTRATION CARD IMMEDIATELY TO REGISTER YOUR UNIT WITH THE FACTORY.

B & K MANUFACTURING COMPANY

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